



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/637,520	08/10/2000	Thomas Michael Walley	10001892-1	7579

57299 7590 04/04/2006

AVAGO TECHNOLOGIES, LTD.
P.O. BOX 1920
DENVER, CO 80201-1920

EXAMINER

PERUNGAVOOR, SATHYANARAYA V

ART UNIT	PAPER NUMBER
----------	--------------

2624

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/637,520	Applicant(s) WALLEY ET AL.	
	Examiner Sath V. Perungavoor	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

[1] A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 19, 2006 has been entered.

Response to Arguments/Amendments

[2] Presented arguments have been fully considered, but are rendered moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[3] Claims 1, 3, 5-7, 9-15 and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raynal et al. ("Raynal") [US 6,643,389] in view of Bohn et al. ("Bohn") [US 6,207,945].

Regarding claim 1, Raynal discloses the following claim limitations:

A fingerprint imager [Figure 1] for capturing an image of a fingerprint comprising: a single sensor integrated circuit (i.e. single chip) having an imaging array (i.e. 13) having [Column 4, Lines 30-39; Figure 2] an imaging array (i.e. 13) having a plurality of sensors arranged along a first axis (i.e. horizontal) [Figures 1 and 2] for capturing a sub-image (i.e. partial images) of the fingerprint at one time [Column 3, Lines 31-37]; wherein the fingerprint (i.e. 17) is moved with respect to the imaging array (i.e. 13) in a direction that is generally perpendicular to the first axis (i.e. horizontal) [Column 3, Lines 48-50; Figures 1 and 2]; and a mechanism (i.e. 19) for determining a change in the position (i.e. direction) of the fingerprint with respect to time and controlling the image capture of the imaging array (i.e. 13) [Column 3, Lines 58-60; Column 4, Lines 7-14] that includes a navigation sensor (i.e. 19) for capturing navigation information (i.e. movement) of a portion of the fingerprint as the fingerprint moves with respect to the navigation sensor (i.e. 19) [Column 3, Lines 48-60]; and a navigation circuit (i.e. 27), coupled to the navigation sensor (i.e. 19), for controlling when the navigation sensor captures navigation information and for receiving the navigation information and based thereon for determining the amount of movement of a fingerprint [Column 4, Lines 1-14].

Raynal does not explicitly disclose the following claim limitations:

A navigation array having a plurality of sensors of capturing navigation images and determining the movement along a first axis and a second axis that is perpendicular to the first axis.

However, in the same field of endeavor Bohn discloses the deficient claim limitations, as follows:

A navigation array (i.e. 130) having a plurality of sensors of capturing navigation images [Figure 3] and determining the movement along a first axis (i.e. x-direction) and a second axis (i.e. y-direction) that is perpendicular to the first axis [Column 12, Lines 18-32].

Raynal and Bohn are combinable because they are from the same field of image reconstruction from sub-images.

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Raynal with Bohn to implement movement determination using a navigation array instead of a mouse, the motivation being to obtain accurate position information [Column 3, Lines 34-37].

Regarding claim 3, Bohn meets the additional claim limitations, as follows:

The fingerprint imager of claim 1 wherein the imaging array (i.e. 120) and the navigation array (i.e. 130) share at least one sensor [Figure 3; Column 4, Lines 37-46].

Regarding claim 5, Bohn meets the additional claim limitations, as follows:

The fingerprint imager of Claim 1 wherein the plurality of sensors of the imaging array is one of resistive-type sensors, capacitive type sensors, and optical-type sensors [Column 9, Lines 40-41: *optical-type*]; and wherein the plurality of sensors of the navigation array is one of resistive-type sensors, capacitive type sensors, and optical type sensors [Column 10, Lines 3-4: *optical-type*].

Regarding claim 6, Bohn meets the additional claim limitations, as follows:

Art Unit: 2624

The fingerprint imager of Claim 1 wherein the fingerprint imager includes a surface along which a finger is moved and wherein the fingerprint imager is implemented in a stand-alone unit comprising: a) optics for focusing light onto the surface [*Column 10, Lines 62-64*]; and b) optics assembly for housing the optics [*100 on Figure 1*].

Regarding claim 7, all claimed limitations are set forth and rejected as per discussion for claim 6.

Regarding claim 9, Raynal meets the additional claim limitations, as follows:

The fingerprint imager of Claim 1 wherein the fingerprint imager includes a surface along which a finger is moved (i.e. swept) and wherein the surface is one of a physical surface and an optical imaging plane [*Column 3, Lines 48-50: physical surface*].

Regarding claim 10, Bohn meets the additional claim limitations, as follows:

The fingerprint imager of Claim 1 wherein the pixel size (i.e. concentration/pitch) of the sensors of the imaging array is different from the pixel size (i.e. concentration/pitch) of the sensors in the navigation array [*Column 7, Lines 7-14*].

Regarding claim 11, Raynal and Bohn meet the additional claim limitations, as follows:

The fingerprint imager of Claim 10 wherein the pixel size (i.e. pitch) of the sensors of the imaging array has the dimensions of about 50 microns by about 50 microns [*Raynal: Column 3, Lines 38-47*] and the pixel size (i.e. pitch) of the sensors of the navigation array has the dimensions of about 42 microns by about 42 microns [*Bohn:*

Column 7 Lines 7-14: 1 U.S. Inches = 25400 Surface Microns, 600 photosensors/inch ~ 42.34 microns].

Raynal and Bohn do not disclose expressly that the pixel size of the sensors of the navigation array has the dimensions of about 20 microns by about 20 microns.

At the time of the invention, it would have been obvious (as a matter of *design choice*) to a person of ordinary skill in the art to reduce pixel size in order to achieve finer precision in movement measurements. Applicant(s) has not disclosed that dimensions of about 20 microns by about 20 microns provides an advantage, is used for a particular purpose or solves a stated problem.

Regarding claim 12, Raynal meets the additional claim limitations, as follows:

The fingerprint imager of Claim 1 wherein the resolution of the sensor of the imaging array and the sensors of the navigation array is about 500 dots per inch [*Column 3, Lines 38-60*].

Regarding claim 13, Raynal meets the additional claim limitations, as follows:

The fingerprint imager of Claim 1 wherein the fingerprint imager is implemented in a stand-alone unit and wherein the fingerprint imager further comprises: a) a capacitive sensor having a surface along which a finger is moved [*Column 3, Lines 38-40 and 48-50*]; and b) an assembly for housing (i.e. chip) the capacitive sensor [*Column 4, Lines 30-39*].

Art Unit: 2624

Regarding claim 14, all claimed limitations are set forth and rejected as per discussion for claim 13.

Regarding claim 15, Raynal meets the additional claim limitations, as follows:

The fingerprint imager of Claim 1 further comprising: a) an imaging array strobe generator for employing the change in position to selectively control when the imaging array captures the sub-images [*Column 4, Lines 1-14*]; and b) a processor (i.e. micro-controller) [*Column 4, Lines 30-39*]; c) a composite image generation software which when executing on the processor receives the sub-images and the movement information for each sub-image relative to a previous sub-image and based thereon generates a composite image of the fingerprint [*Column 5, Lines 37-46*]; and d) an identification software which when executing on the processor receives the composite image of the fingerprint, analyzes the composite image to generate minutia, and compares the generated minutia to previously stored minutia [*Column 4, Lines 30-39*], and grants access to a resource if the generated minutia matches one of the previously stored minutia [*Column 1, Lines 13-19*].

Regarding claim 17, Bohn meets the additional claim limitations, as follows:

The fingerprint imager of Claim 1 wherein the imaging array is a 1 by N (i.e. linear array) sensor array (i.e. 120) [*Column 4, Lines 37-46*].

Regarding claim 18, Bohn meets the additional claim limitations, as follows:

The fingerprint imager of Claim 1 wherein the navigation array (i.e. 130) is a P by Q (i.e. two-dimensional array) sensor array [*Column 4, Lines 37-46*].

Regarding claims 19 and 20 all claimed limitations are set forth and rejected as per discussion for claims 1 and 15.

Regarding claim 21, Raynal and Bohn meet the additional claim limitations, as follows:

The method of claim 20 wherein the fingerprint (i.e. 17) that has a width [*Raynal: Figure 1*]; and wherein successively capturing a plurality of sub-images by using the imaging sensor array as the fingerprint moves with respect to the imaging sensor array in a single pass [*Raynal: Column 3, Lines 48-50; Column 4, Lines 25-29*] includes employing a 1xN (i.e. linear array) imaging sensor (i.e. 120) array that includes N sensors [*Bohn: Column 4, Lines 37-46*] and that captures sub-images of the fingerprint that include substantially the width of the fingerprint [*Raynal: Column 3, Lines 48-50; Column 4, Lines 25-29*].

[4] Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raynal et al. ("Raynal") [US 6,643,389] in view of Blalock et al. ("Blalock") [US 5,729,008].

Regarding claim 1, Raynal discloses the following claim limitations:

A fingerprint imager [*Figure 1*] for capturing an image of a fingerprint comprising: a single sensor integrated circuit (i.e. single chip) having an imaging array (i.e. 13)

having [Column 4, Lines 30-39; Figure 2] an imaging array (i.e. 13) having a plurality of sensors arranged along a first axis (i.e. horizontal) [Figures 1 and 2] for capturing a sub-image (i.e. partial images) of the fingerprint at one time [Column 3, Lines 31-37]; wherein the fingerprint (i.e. 17) is moved with respect to the imaging array (i.e. 13) in a direction that is generally perpendicular to the first axis (i.e. horizontal) [Column 3, Lines 48-50; Figures 1 and 2]; and a mechanism (i.e. 19) for determining a change in the position (i.e. direction) of the fingerprint with respect to time and controlling the image capture of the imaging array (i.e. 13) [Column 3, Lines 58-60; Column 4, Lines 7-14] that includes a navigation sensor (i.e. 19) for capturing navigation information (i.e. movement) of a portion of the fingerprint as the fingerprint moves with respect to the navigation sensor (i.e. 19) [Column 3, Lines 48-60]; and a navigation circuit (i.e. 27), coupled to the navigation sensor (i.e. 19), for controlling when the navigation sensor captures navigation information and for receiving the navigation information and based thereon for determining the amount of movement of a fingerprint [Column 4, Lines 1-14].

Raynal does not explicitly disclose the following claim limitations:

A navigation array having a plurality of sensors of capturing navigation images and determining the movement along a first axis and a second axis that is perpendicular to the first axis.

However, in the same field of endeavor Blalock discloses the deficient claim limitations, as follows:

A navigation array (i.e. 24) having a plurality of sensors of capturing navigation images [Figure 2] and determining the movement along a first axis (i.e. x-direction)

Art Unit: 2624

and a second axis (i.e. y-direction) that is perpendicular to the first axis [*Figure 1;*

Column 5, Lines 10-19; Column 8 Lines 21-30]].

Raynal and Blalock are combinable because they are from the same field of image reconstruction from sub-images.

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Raynal with Blalock to implement movement determination using a navigation array instead of a mouse, the motivation being to obtain three degrees of freedom [*Column 3, Lines 39-47*].

Regarding claim 4, Blalock meets the additional claim limitations, as follows:

The fingerprint imager of Claim 1 wherein the imaging array (i.e. 22) is separate from the navigation array (i.e. 24).

[5] Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raynal et al. ("Raynal") [US 6,643,389] in view of Bohn et al. ("Bohn") [US 6,207,945] further in view of Akizuki [US 6,360,004].

Regarding claim 8, Raynal and Bohn disclose the claim limitations as set forth in claim 7.

Raynal and Bohn do not explicitly disclose the following claim limitations:

The fingerprint imager of Claim 7 wherein the PC peripheral device is one of a cursor pointing device and a keyboard.

However, in the same field of endeavor Akizuki discloses the deficient claim limitations, as follows:

Art Unit: 2624

The fingerprint imager of Claim 7 wherein the PC peripheral device is one of a cursor pointing device (i.e. 4) and a keyboard [*Figure 1: touch pad*].

Raynal and Bohn and Akizuki are combinable because they are from the same field of fingerprint imaging.

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Raynal and Bohn with Akizuki to implement the fingerprint imager on a touch pad, the motivation being to provide dual functionality [*Column 2, Lines 12-16*].

Regarding claim 16, Raynal and Bohn disclose the following claim limitations:

The fingerprint imager of Claim 1 further comprising: a) a processor (i.e. micro-controller) [*Raynal: Column 4 Lines 30-39*]; and

Raynal and Bohn do not explicitly disclose the following claim limitations:

b) a cursor control software which when executing on the processor receives the movement information from the navigation circuit and uses the movement information to control the cursor.

However, in the same field of endeavor Akizuki discloses the deficient claim limitations, as follows:

b) a cursor control software which when executing on the processor receives the movement information from the navigation circuit and uses the movement information to control the cursor [*Column 3, Lines 47-51*].

Raynal and Bohn and Akizuki are combinable because they are from the same field of fingerprint imaging.

Art Unit: 2624

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Raynal and Bohn with Akizuki to implement the fingerprint imager on a touch pad, the motivation being to provide dual functionality [Column 2, Lines 12-16].

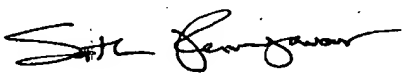
Contact Information

[6] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Sath V. Perungavoor whose telephone number is (571) 272-7455. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Bhavesh M. Mehta whose telephone number is (571) 272-7453, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dated: April 3, 2006

By: 

Sath V. Perungavoor
Telephone: (571) 272-7455

WENPENG CHEN
PRIMARY EXAMINER

